

CLAIM AMENDMENTS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. – 20. (Canceled)

21. (Previously Presented) A device comprising:

a first actuator control law portion comprising an input to receive a representation of a first actuator position, and an output;

a second actuator control law portion comprising an input to receive a representation of a second actuator position, and an output;

a first actuator decoupler portion comprising a first input coupled to the output of the first actuator control law portion and a second input coupled to the output of the second actuator control law portion, and an output to provide a signal with decoupling compensation for a first actuator based on the representation of the second actuator position.

22. (Currently Amended) The device, as recited in Claim 21, wherein the first actuator decoupler comprises a linear modification module having an input coupled to the output of the second actuator control law portion, and an output to provide a linearly scaled representation of a value received at its input; wherein the linearly scaled representation is used to provide the signal with decoupling compensation for the first actuator decoupler portion.

23. (Previously Presented) An optical disk drive comprising:
a focus control loop;
a tracking control loop, wherein the focus control loop and the tracking control loop are cross-coupled, wherein a focus control command excites the tracking control loop and a tracking control command excites the focus control loop; and
a decoupler configured to produce a modified focus control command from the focus control command and the tracking control command, and configured to produce a modified tracking control command based on the tracking control command and the focus control command, wherein the modified focus control command has a different excitation of the tracking control loop than the focus control command and wherein the modified tracking control command has a different excitation of the focus control loop than the tracking control command.
24. (Original) The optical disk drive as recited in Claim 23, further comprising:
a lens assembly, wherein the focus loop comprises a focus actuator configured to move the lens assembly in a focus direction.
25. (Original) The optical disk drive as recited in Claim 23, further comprising:
a lens assembly, wherein the tracking loop comprises a tracking actuator configured to move the lens assembly in a tracking direction.
26. (Original) A method comprising:
determining cross-coupling characteristics of a focus actuator and a tracking actuator of an optical pickup unit; and
determining a decoupling matrix to decouple the focus actuator and the tracking actuator.
27. (Original) The method as recited in Claim 26, further comprising:
determining a focus control law variable of the focus actuator, the focus control law variable for determining focus control commands for controlling a focus position of an optical pickup unit; and

determining a tracking control law variable of the tracking actuator, the tracking control law variable for determining tracking control commands for controlling a tracking position of the optical pickup unit.

28. (Original) The method as recited in Claim 27, wherein determining the focus control law variable comprises:

determining one or more focus forces to be applied to the focus actuator as the focus control commands; and
measuring the results of the one or more focus forces on the focus position; and
determining gain factors relating to the results of the one or more focus forces on the focus position.

29. (Original) The method as recited in Claim 27, wherein determining the tracking control law variable comprises:

determining one or more tracking forces to be applied to the tracking actuator as the tracking control commands; and
measuring the results of the one or more tracking forces on the tracking position; and
determining gain factors relating to the results of the one or more tracking forces on the tracking position.

30. (Original) The method as recited in Claim 26, wherein determining the cross-coupling characteristics comprises:

determining one or more focus forces to be applied the focus actuator as the focus control commands;
measuring the results of the one or more focus forces on the tracking position;
determining a specific process relating to the results of the one or more focus forces on the tracking position;
determining one or more tracking forces to be applied to the tracking actuator as the tracking control commands;
measuring the results of the one or more tracking forces on the focus position; and
determining another specific process relating to the results of the one or more tracking forces on the focus position.

31. (Previously Presented) An optical disk drive comprising:
a lens assembly;
a focus actuator that is configured to move the lens assembly in a focus direction;
a tracking actuator that is configured to move the lens assembly in a tracking direction;
and
a decoupler configured to decouple the focus actuator from the tracking actuator by
reducing signal cross coupling.

32. (Original) The optical disk drive, as recited in Claim 31, wherein the decoupler modifies a focus command to have a reduced effect on a tracking position of the lens assembly and modifies a tracking command to have a reduced effect on a focus position of the lens assembly.

33. (Original) The optical disk drive as recited in Claim 31, wherein the decoupler is a software routine stored on computer readable media.

34. (Original) The optical disk drive as recited in Claim 31, wherein the decoupler is an analog circuit.

35. (Original) The optical disk drive as recited in Claim 31, wherein the decoupler is an electro-mechanical circuit.

36. (Original) An optical disk drive comprising:
means for determining cross-coupling characteristics of a focus actuator and a tracking actuator; and
means for determining a decoupling matrix to decouple the focus actuator and the tracking actuator.

37. (Original) The optical disk drive, as recited in Claim 36, further comprising:
means for determining focus control laws of the focus actuator, the focus control laws for
determining focus control commands for controlling a focus position of an optical
pickup unit; and
means for determining tracking control laws of the tracking actuator, the tracking control
laws for determining tracking control commands for controlling a tracking
position of the optical pickup unit.